Method of Test for

DETERMINING CHLORIDE CONTENT IN ADMIXTURES FOR PORTLAND CEMENT CONCRETE

DOTD Designation: TR 643-10

I. Scope

This method describes the determination of chloride content in admixtures for Portland cement concrete.

II. Apparatus

A. **Volumetric flask** – 100 mL
B. **Deionized Water**
C. **Volumetric Pipet** – 25 mL
D. **Bulb** for pipet
E. **Rubber stopper** for flask
F. **Admixtures for Concrete** worksheet, Figure 1

III. Reagents

Standard solutions of chloride ions with a concentration accurate to 100, 200, and 400 ppm to create calibration curve.

IV. Health Precautions

Proper equipment and precautions are to be used whenever toxic samples are used. Use appropriate safety equipment such as safety glasses, gloves, and lab coats. Wash hands frequently.

V. Sample

Refer to LA DOTD Materials Sampling Manual S 601-99 Section III., Liquid in Drums and Other Containers. Ensure that the representative portion of the sample is stored in a metallic container with a secure lid.

VI. Procedure

A. Transfer 25 mL of the test specimen to the volumetric flask by using the 25 mL volumetric pipet and bulb. Ensure that the meniscus reaches the 25 mL mark on the volumetric pipet.
B. Dilute with deionized water until the meniscus reaches the 100 ml mark on the volumetric flask.
C. Record the ratio (1:3) on the admixture worksheet.
D. Ensure test specimen is homogenized by inverting the volumetric flask several times with the use of the rubber stopper.
E. Perform analysis on calibrated (ICP) against chloride standards.
F. Record the concentration of chloride in parts per million (ppm) on admixture worksheet.

VII. Calculations

$$\%\,\text{chloride} = \left(\text{A} \div 10000\right) \times D$$

Where,

A = chloride concentration in (ppm) obtained from the ICP
10000 = constant (conversion from ppm to percentage)
D = dilution factor (for ratio of 1:3, dilution factor is 4)

Example,

A = 100 ppm
D = 4 (ratio is 1:3)

$$\begin{aligned} \%\,\text{chloride} &= (A \div 10000) \times D \\ &= (100 \div 10000) \times 4 \\ &= (0.01) \times 4 \\ &= 0.04 \end{aligned}$$

VIII. **Report**

The data shall be reported to the nearest hundredth percent chloride on the admixture worksheet, figure 1.

IX. **Normal Test Reporting Time**

The normal amount of time to report on chloride content analysis in admixtures is approximately 2 days.

3/10

Louisiana Department of Transportation and Development
Materials Section

ADMIXTURES FOR CONCRETE

REMARKS 2

		TEST RESULTS (Max. of 15 characters)	P/F
		xxxxxxxxxxxxxxxxxxxxxxxxx	xxx
TYPE		Daravo II	xxx
INFRARED SPECTROPHOTOMETRIC ANALYSIS (TR 610)		xxxxxxxxxxxxxxxxxxxxxxxxx	P
Standard Curve #	58BM		
SOLIDS, % (B + A) x 100 (TR 524)		9.84	P
Wt. of Tare + Sample, g	5.7446		
Wt. of Tare, g	0.9855		
Wt. of Sample, g (A)	4.8041		
Wt. of Tare + Sample after Evap., g	1.4787		
Wt. of Tare, g	0.9855		
Wt. of Residue, g (B)	0.4733		
		xxxxxxxxxxxxxxxxxxxxxxxxx	xxx
DOSAGE, g: WRNS (C x 28.35)			
Dosage, oz: WRNS (C)			
DOSAGE, g: WRSR (D x 28.35)			
Dosage, oz: WRSR (D)			
DOSAGE, g: AIR ENTRAINING (E x 28.35)			
Dosage, oz: Air Entraining (E)			
CHLORIDE CONTENT, % (A/10,000) x D (DOTD TR 643)		0.04 %	
A (ppm)	100		
D (dilution factor)	4		

Tested by: TM Date: 3/18/10 Checked by: _____ Date: _____

APPROVED BY: ENGINEER Date: 3/18/10

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Figure 1